

## REMARKS

Applicant appreciates the Examiner indication that the subject matter of claims 26-34 defines over the prior art, and that these claims would be allowed if amended to overcome the various objections or rejections under 35 U.S.C. § 112, second paragraph. In response, appropriate amendments are made herein to place this application in condition for allowance. Specifically, in response to the Advisory Action, claims 26 and 30-32 have been amended. Support for the amendments is found in the specification and claims as filed. The specification has also been amended. As the Advisory Action indicate that the previously amendments had not been entered, the annotations made in the foregoing amendments are made with reference to the version of the specification and claims, as they existed prior to Applicant's previous submission.

In response to paragraph 1 of the Office Action (the directive that claims 11-21 must be cancelled), Applicant has cancelled these claims. The cancellation of these claims is made with the understanding that, if these claims are pursued in a divisional application, the Examiner will not reject these claims based on the art presently relied upon in this application. In this regard, such a rejection would be tantamount to an admission that these claims COULD be examined in the present application, without any undue burden on the Examiner. If the Examiner does not agree with this position, then the undersigned requests that claims 11-21 not be cancelled, and instead be examined in this application.

As the foregoing amendments are supported by the contents of the original application, the amendments do not constitute the addition of new matter. Claims 26-34

remain pending in the present application. Reconsideration of the application in view of the foregoing amendments and following comments is respectfully requested.

### **Specification - 35 U.S.C. §132(a) New Matter Objection**

Regarding the sixth paragraph on page 5 (page 5, line 23 to page 6, line 8):

The Office Action stated that the “includes” used in “A monomer of the waterborne polyurethane includes 2,2-bis (hydroxymethyl) propionic acid” broadens the scope of the recited materials.

It is well known that polyurethane (PU) is usually pre-polymerized by a diisocyanate monomer and a diol monomer to form a PU prepolymer, and the chain length of the PU prepolymer is then extended by a chain extender, such as a diamine, to form the PU. Reflective of this understanding, Applicant references pages 3-4 of “waterborne polyurethanes – polyurethane research,” by Bayer Polymers (hereinafter as “Bayer”). A copy of this reference is attached hereto as Exhibit A for the Examiner’s convenience. A copy will be formally submitted with an Information Disclosure Statement. Hence, 2,2-bis (hydroxymethyl) propionic acid, a kind of diol, is only one kind of monomer of polyurethane and has to react with another monomer, diisocyanate, to form the polyurethane.

Accordingly, the term “includes,” as used in “A monomer of the waterborne polyurethane includes 2,2-bis (hydroxymethyl) propionic acid,” does not broaden the scope but rather merely reflects the common knowledge of polyurethane.

In response to the Office Action's objections and rejections related to "weight ratio," appropriate amendments have been made to address and overcome these objection/rejections.

The Office Action stated that the amendment of changing "diamine containing sulfoate salt" to "a diamine containing a sulfonate functional group" does not have basis. Applicant disagrees.

As explained above, a diamine can be used as a chain extender to prepare the polyurethane. Hence, "diamine containing sulfonate salt" can only be reasonably explained to "a diamine containing (or having) a sulfonate functional group" or "a salt formed by a diamine and a sulfonic acid." However, since waterborne polyurethane is needed in this application, "a diamine containing (or having) a sulfonate functional group" is much more reasonable, since a sulfonate functional group is a hydrophilic functional group. Therefore, this amendment is based on both the description in the original application and the common knowledge of waterborne polyurethane, as understood by persons skilled in the art.

Applicant has also amended the third paragraph on page 6 (page 6, line 21 to page 7, line 9). This amendment is believed to be proper, and the paragraph is in proper form for allowance with the remainder of the application.

In addition, all amendments related to weight ratio have been revised and/or effectively withdrawn, and hence no decimal accuracy of the prior cited percentages is changed.

Applicant has also amended the third paragraph on page 14 (page 14, line 23 to page 15, line 2). This amendment is believed to be proper, and the paragraph is in proper form for allowance with the remainder of the application.

Accordingly, reconsideration and withdrawal of these objections are respectfully requested.

### **Claim Rejection - 35 U.S.C. §112, First Paragraph**

With respect to paragraphs 3-4 of the Office Action, the Office Action rejected claims 26-34 under 35 U.S.C. §112, first paragraph for allegedly failing to comply with the written description requirement. In response, Applicant sets forth the following comments:

With regard to the language of: "phase-change material having a polar functional group and a lipophilic moiety" in claim 26, Applicant submits the following. In line 10-15 on page 6 of the specification as filed, "The phase-change material is an organic compound with polarity, such as carboxylic ester. .... A carboxylate of the carboxylic ester is selected from a group formate, acetate and propionate and carbon numbers of an alkoxyl of the carboxylic ester is between 10 and 18" was disclosed. The carboxylate of the carboxylic ester is the polar moiety of the phase-change material, and the long aliphatic chain of the alkoxyl of the carboxylic ester is the lipophilic moiety. Hence, "a phase-change material having a polar functional group and a lipophilic moiety" was inherently disclosed in the original specification and can be simply obtained by common chemistry knowledge.

With regard to the phrases: "Wherein the weight ratio of the waterborne polyurethane over the composition is 0.05 – 0.40" in claim 26 and "wherein the weight ratio of the waterborne polyurethane over the composition is 0.10 – 0.30" in claim 30, Applicant notes the following.

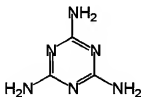
"Wherein the weight ratio of the waterborne polyurethane over the composition is 0.05 – 0.40" in claim 26 has been amend to "wherein the concentration of the waterborne polyurethane aqueous solution is 5% to 40 % by weight", and "wherein the weight ratio of the waterborne polyurethane over the composition is 0.10 – 0.30" in claim 30 has been amend to "wherein the concentration of the waterborne polyurethane aqueous solution is between about 15% and 35% by weight." Support for this language can be found in lines 5-8 of page 6 and original claim 1.

With regard to the language of: "Wherein the weight ratio of the lipophilic monomer over the phase-change material and the waterborne polyurethane is 0.03 – 0.12 and 0.25 – 0.5, respectively" and "the lipophilic monomer is isocyanurate of 1,6-hexamethylene diisocyanate, which can react with the waterborne polyurethane to form shells of the microcapsules" in claim 26, Applicant submits the following.

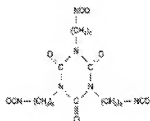
"Wherein the weight ratio of the lipophilic monomer over the phase-change material and the waterborne polyurethane is 0.03 – 0.12 and 0.25 – 0.5, respectively" has been amend to "wherein the concentration of the lipophilic monomer in the phase-change material is between about 3% and about 12% by weight and the lipophilic monomer over the waterborne polyurethane is between about 25% and about

50%.” Support for this language can be found in lines 24 on page 6 to line 4 on page 7 of the specification as filed.

As for “the lipophilic monomer is isocyanurate of 1,6-hexamethylene diisocyanate, which can react with the waterborne polyurethane to form shells of the microcapsules” do have support in the original specification, since melamine (Formula 1) is a hydrophilic molecule (not a lipophilic molecule), and “isocyanate salt” is a typographical error of lipophilic “isocyanate.” Since “isocyanurate of 1,6-hexamethylene diisocyanate (Formula II)” is kind of isocyanate and was disclosed in the embodiments, and nothing else can be the lipophilic monomer among the compositions used in the embodiments, isocyanurate of 1,6-hexamethylene diisocyanate must be the lipophilic monomer. Moreover, since isocyanurate of 1,6-hexamethylene diisocyanate have three isocyanate (–NCO) group, it is naturally that isocyanurate of 1,6-hexamethylene diisocyanate can react with the waterborne polyurethane to form shells of the microcapsules.



Formula I



Formula II

With regard to the language of: “Wherein the weight ratio of the lipophilic monomer over the phase-change material is 0.05 – 0.10” in claim 31, Applicant submits the following. “Wherein the weight ratio of the lipophilic monomer over the

phase-change material is 0.05 – 0.10" has been amend to "wherein the concentration of the lipophilic monomer in the phase-change material is between about 5% and about 10% by weight." The support can be found in line 25 on page 6 to line 2 on page 7.

With regard to the language of: "Wherein the weight ratio of the lipophilic monomer over the waterborne polyurethane is 0.3 – 0.45" in claim 32, Applicant notes the following. "Wherein the weight ratio of the lipophilic monomer over the waterborne polyurethane is 0.3 – 0.45" have been amend to "wherein the lipophilic monomer over the waterborne polyurethane is between about 30% and about 45%". The support can be found in lines 2-4 on page 7.

With regard to "Comprises" of "wherein a monomer of the waterborne polyurethane comprises 2,2-bis (hydroxymethyl) propionic acid" in claim 33, Applicant submits that the claim language is proper. Indeed, Applicant does not fully understand the statement of the Office Action that: "Urethane are thereby now encompassed which were not described in the originally filed specification." (see paragraph "F" of the Office Action, p. 4). As stated above, 2,2-bis (hydroxymethyl) propionic acid is a diol and is a kind of monomer can react with another monomer, diisocyanate, to form polyurethane. Since the propionate functional group of the 2,2-bis (hydroxymethyl) propionic acid is hydrophilic, the obtained polyurethane is waterborne.

Finally, the language of "Sulfonate functional group" in claim 34 is believed to be proper. As stated above, the basis of "a diamine containing a sulfonate functional group" can be found in the original description and the common knowledge of waterborne polyurethane.

For at least the foregoing reasons, all rejections and objections are believed to have been properly addressed in this submission, and this application is now in condition for allowance.

If, in the opinion of the Examiner, a telephonic conference would expedite the examination of this matter, the Examiner is invited to call the undersigned agent at (770) 933-9500.

A credit card authorization has been provided to cover the charges of the accompanying RCE application and petition for extension of time. No addition fee is believed to be due in connection with this submission. If, however, any additional fee is believed to be due, you are hereby authorized to charge any such fee to deposit account No. 20-0778.

Respectfully submitted,  
/Daniel R. McClure/

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